



PI49FCT807T PI49FCT2807T

Fast CMOS Clock Driver

Product Features

- Guaranteed low skew: 0.25ns
- Low input capacitance
- Minimum duty cycle distortion
- 1:10 fanout
- High speed: 3.5ns propagation delay
- TTL input and CMOS output compatible
 - $V_{OH} = 3.3V$ (typ.)
 - $V_{OL} = 0.3V$ (typ.)
- Packages available:
 - 20-pin 300 mil wide SOIC (S)
 - 20-pin 150 mil wide QSOP (Q)
 - 20-pin 209 mil wde SSOP (H)
- Industrial Operation at $-40^{\circ}C$ to $+85^{\circ}C$

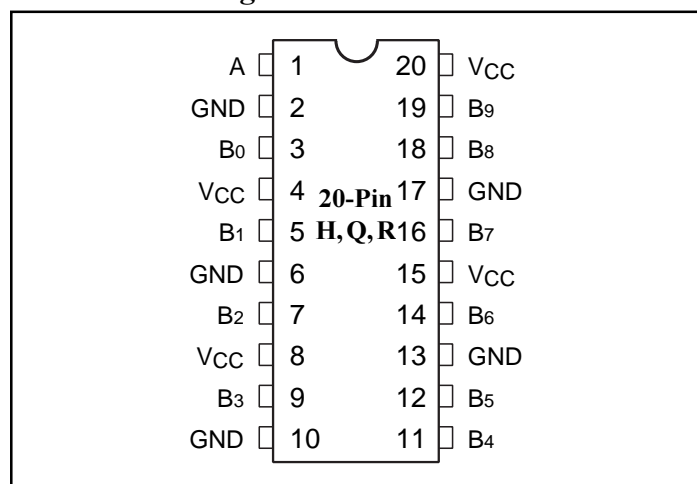
Product Description

Pericom Semiconductor's PI49FCT series of logic circuits are produced using the Company's advanced 0.8 micron CMOS technology, achieving industry leading speed grades.

The PI49FCT807T and PI49FCT2807T clock drivers feature one input and ten outputs. The large fanout from a single input line reduces loading on input clock. TTL level outputs reduce noise levels on the part. Typical applications are clock and signal distribution.

The PI49FCT2807T also features a 25-ohm on-chip resistor for lower noise.

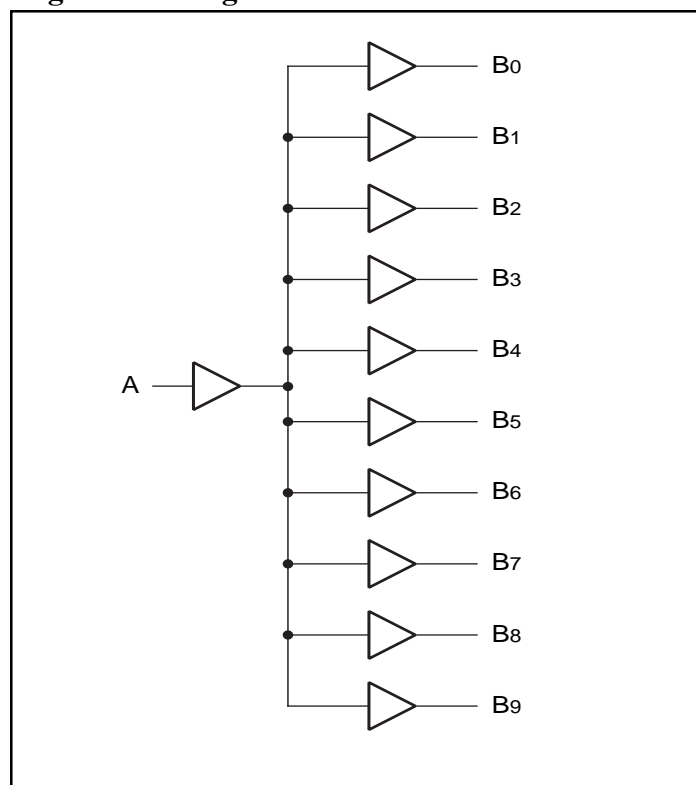
Product Pin Configuration



Product Pin Description

| Pin Name | Description |
|-----------------|-------------|
| A | Input |
| B0 – B9 | Outputs |
| GND | Ground |
| V _{CC} | Power |

Logic Block Diagram



Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

| | |
|--|-----------------|
| Storage Temperature | -65°C to +150°C |
| Ambient Temperature with Power Applied | -40°C to +85°C |
| Supply Voltage to Ground Potential (Inputs & V _{CC} Only) | -0.5V to +7.0V |
| Supply Voltage to Ground Potential (Outputs & D/O Only) .. | -0.5V to +7.0V |
| DC Input Voltage | -0.5V to +7.0V |
| DC Output Current | 120mA |
| Power Dissipation | 0.5W |

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

DC Electrical Characteristics (Over the Operating Range, T_A = -40°C to +85°C, V_{CC} = 5.0V ± 5%)

| Parameters | Description | Test Conditions ⁽¹⁾ | | Min. | Typ. ⁽²⁾ | Max. | Units |
|------------------|-----------------------|--|-----------------------------|------|---------------------|------|-------|
| V _{OH} | Output HIGH Voltage | V _{CC} = Min., V _{IN} = V _{IH} or V _{IL} | I _{OH} = -15.0mA | 2.4 | 3.3 | | V |
| | | | I _{OH} = 48.0mA | | 0.2 | 0.5 | V |
| V _{OL} | Output LOW Current | V _{CC} = Min., V _{IN} = V _{IH} or V _{IL} | I _{OL} = 12mA(25Ω) | | 0.2 | 0.5 | V |
| V _{IH} | Input HIGH Voltage | Guaranteed Logic HIGH Level | | 2.0 | | | V |
| V _{IL} | Input LOW Voltage | Guaranteed Logic LOW Level | | | | 0.8 | V |
| I _{IH} | Input HIGH Current | V _{CC} = Max. | V _{IN} = 2.7V | | | 1 | μA |
| I _{IL} | Input LOW Current | V _{CC} = Max. | V _{IN} = 0.5V | | | -1 | μA |
| I _I | Input HIGH Current | V _{CC} = Max., V _{IN} = V _{CC} (Max.) | | | | 20 | μA |
| V _{IK} | Clamp Diode Voltage | V _{CC} = Min., I _{IN} = -18mA | | | -0.7 | -1.2 | V |
| I _{OS} | Short Circuit Current | V _{CC} = Max. ⁽³⁾ , V _{OUT} = GND | | -60 | -120 | -225 | mA |
| I _{OFF} | Power Down Disable | V _{CC} = GND, V _{OUT} = 4.5V | | — | — | 100 | μA |
| V _H | Input Hysteresis | | | | 150 | | mV |

Capacitance (T_A = 25°C, f = 1 MHz)

| Parameters ⁽⁴⁾ | Description | Test Conditions | Typ. | Max. | Units |
|---------------------------|--------------------|-----------------------|------|------|-------|
| C _{IN} | Input Capacitance | V _{IN} = 0V | 6.0 | 10 | pF |
| C _{OUT} | Output Capacitance | V _{OUT} = 0V | 8 | 12 | pF |

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{CC} = 5.0V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. This parameter is determined by device characterization but is not production tested.

Power Supply Characteristics

| Parameters | Description | Test Conditions ⁽¹⁾ | | Min. | Typ. ⁽²⁾ | Max. | Units |
|------------|---|---|--|------|---------------------|-------------------|------------|
| ICC | Quiescent Power Supply Current | V _{CC} = Max. | V _{IN} = GND or V _{CC} | | 3 | 30 | μA |
| ΔICC | Supply Current per Input @ TTL HIGH | V _{CC} = Max., | V _{IN} = 3.4V ⁽³⁾ | | 0.5 | 1.5 | mA |
| ICCD | Supply Current per Input per MHz ⁽⁴⁾ | V _{CC} = Max., Outputs Open 50% Duty Cycle, One Input Toggling | V _{IN} = V _{CC} V _{IN} = GND | | 0.4 | 0.6 | mA/ MHz |
| IC | Total Power Supply Current ⁽⁶⁾ | V _{CC} = Max., Outputs Open f _{CP} = 50 MHz, 50% Duty Cycle | V _{IN} = V _{CC} V _{IN} = GND | | 20 | 30 ⁽⁵⁾ | mA |
| | | | V _{IN} = 3.4V V _{IN} = GND | | 20.7 | 33 ⁽⁵⁾ | |

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V_{CC} = 5.0V, +25°C ambient.
- Per TTL driven input (V_{IN} = 3.4V); all other inputs at V_{CC} or GND.
- This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
- Values for these conditions are examples of the ICC formula. These limits are guaranteed but not tested.
- IC = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}

$$IC = ICC + \Delta ICC \cdot DH_{NT} + ICCD \cdot (f_{CP}/2 + fi \cdot Ni)$$

ICC = Quiescent Current
ΔICC = Power Supply Current for a TTL High Input (V_{IN} = 3.4V)
DH = Duty Cycle for TTL Inputs High
NT = Number of TTL Inputs at DH
ICCD = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)
f_{CP} = Clock Frequency for Register Devices (Zero for Non-Register Devices)
fi = Input Frequency
Ni = Number of Inputs at fi
All currents are in milliamps and all frequencies are in megahertz.

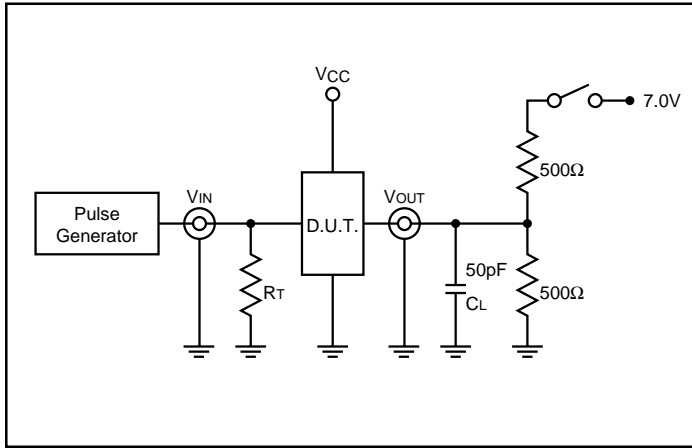
Switching Characteristics over Operating Range

| Parameters | Description | Conditions ⁽¹⁾ | 807/2807T | | 807AT | | 807BT | | 807CT | | Units |
|--------------|---|---------------------------|-----------|------|-------|------|-------|------|-------|------|-------|
| | | | Com. | | Com. | | Com. | | Com. | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| tPLH tPHL | Propagation Delay A TO BN | CL = 50pF RL = 500Ω | 1.5 | 4.5 | 1.5 | 4.0 | 1.5 | 3.8 | 1.5 | 3.5 | ns |
| tSK(o) | Skew between two outputs of same package ⁽³⁾ | | — | 0.5 | — | 0.5 | — | 0.35 | — | 0.25 | ns |
| tSK(p) | Skew between opposite transitions of same output (tPHL — tPLH) ⁽³⁾ | | — | 0.5 | — | 0.5 | — | 0.35 | — | 0.35 | ns |
| tSK(t) | Skew between outputs of different package at same power supply, temperature and speed grade ⁽³⁾ | | — | 1.0 | — | 1.0 | — | 0.75 | — | 0.75 | ns |

Notes:

- See test circuit and wave forms.
- Minimum limits are guaranteed but not tested on Propagation Delays.
- This parameter is guaranteed but not tested.

Tests Circuits For All Outputs⁽¹⁾



Switch Position

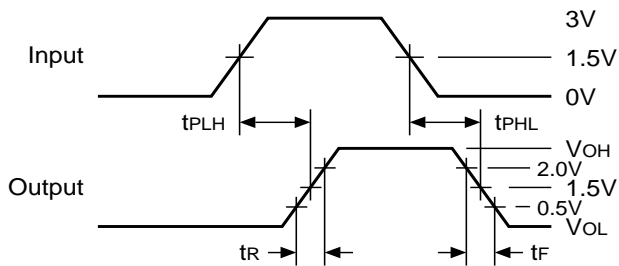
| Test | Switch |
|---|--------|
| Open Drain Disable LOW Enable LOW | Closed |
| All Other Inputs | Open |

Definitions:

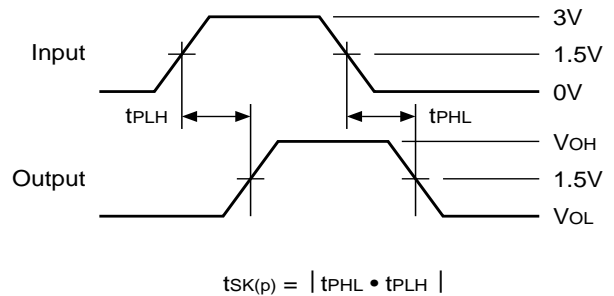
C_L = Load capacitance: includes jig and probe capacitance.
 R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator.

Switching Waveforms

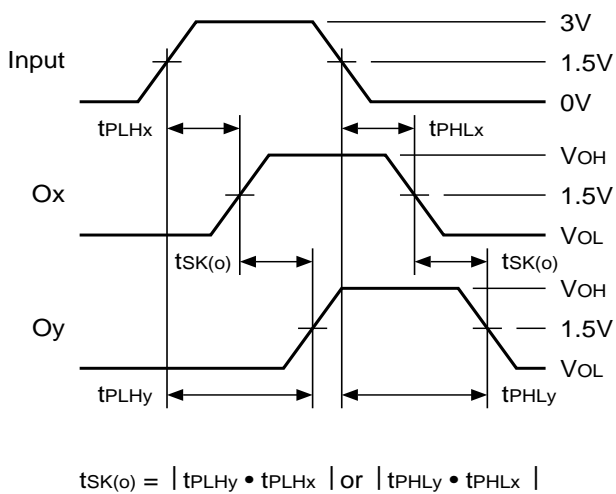
Propagation Delay



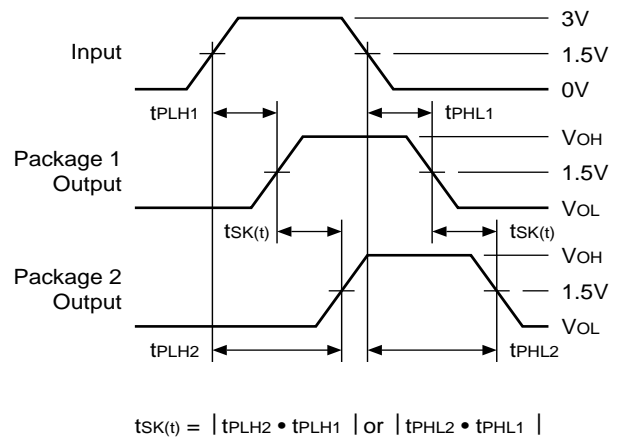
Pulse Skew – $t_{SK(p)}$

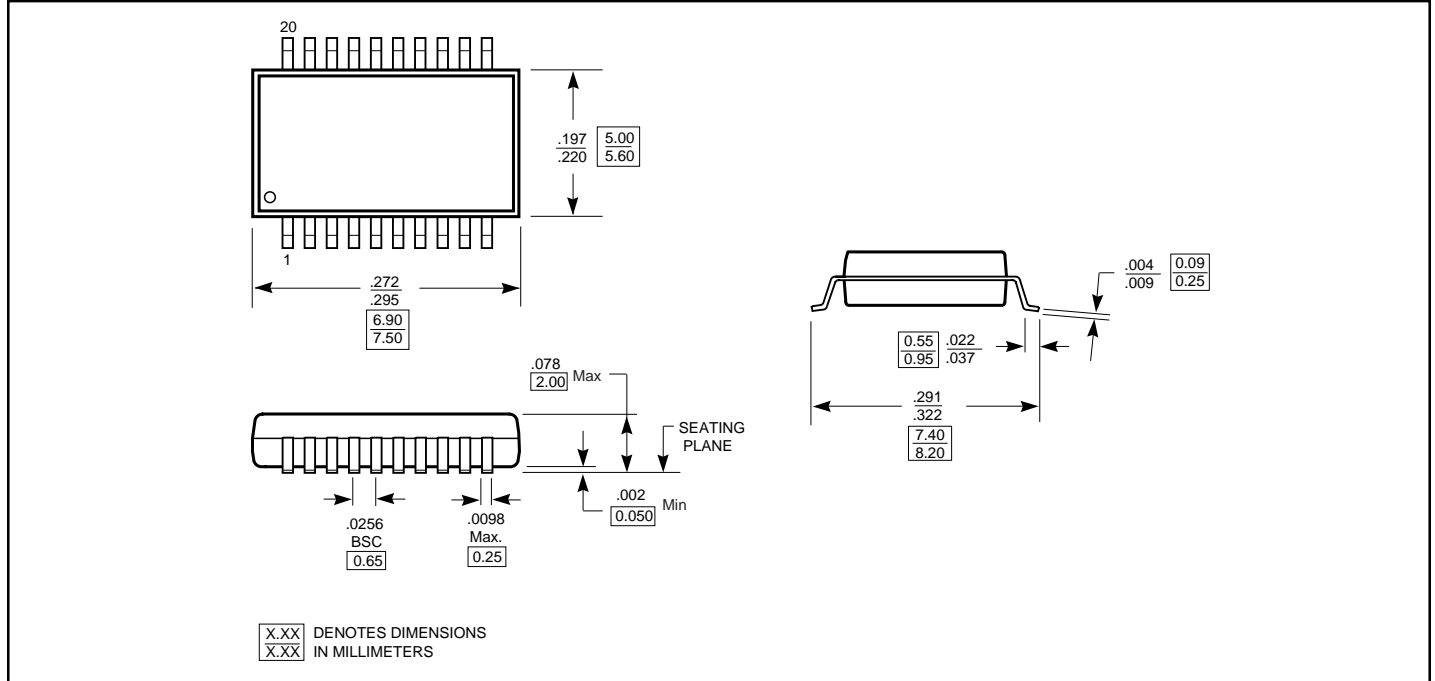
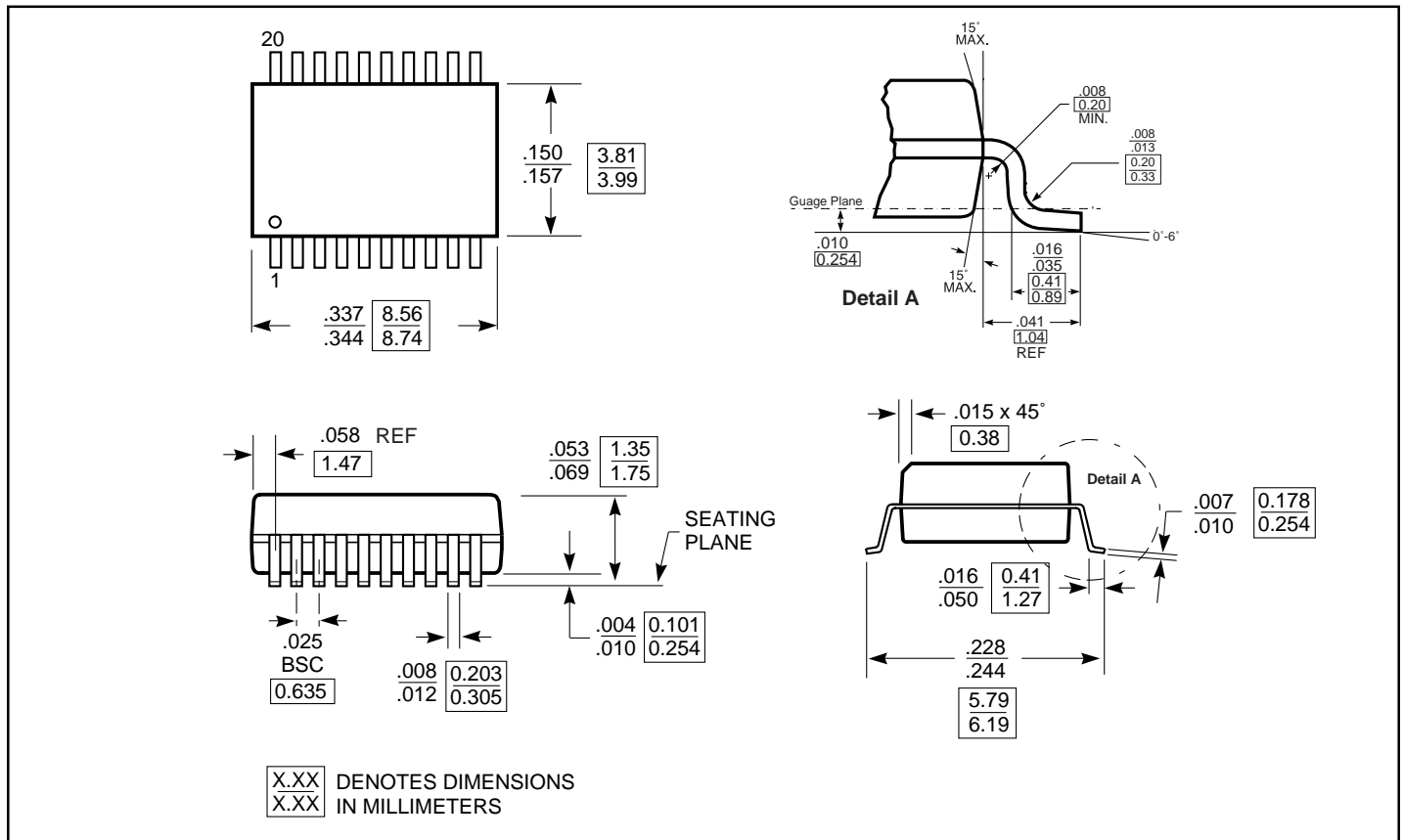


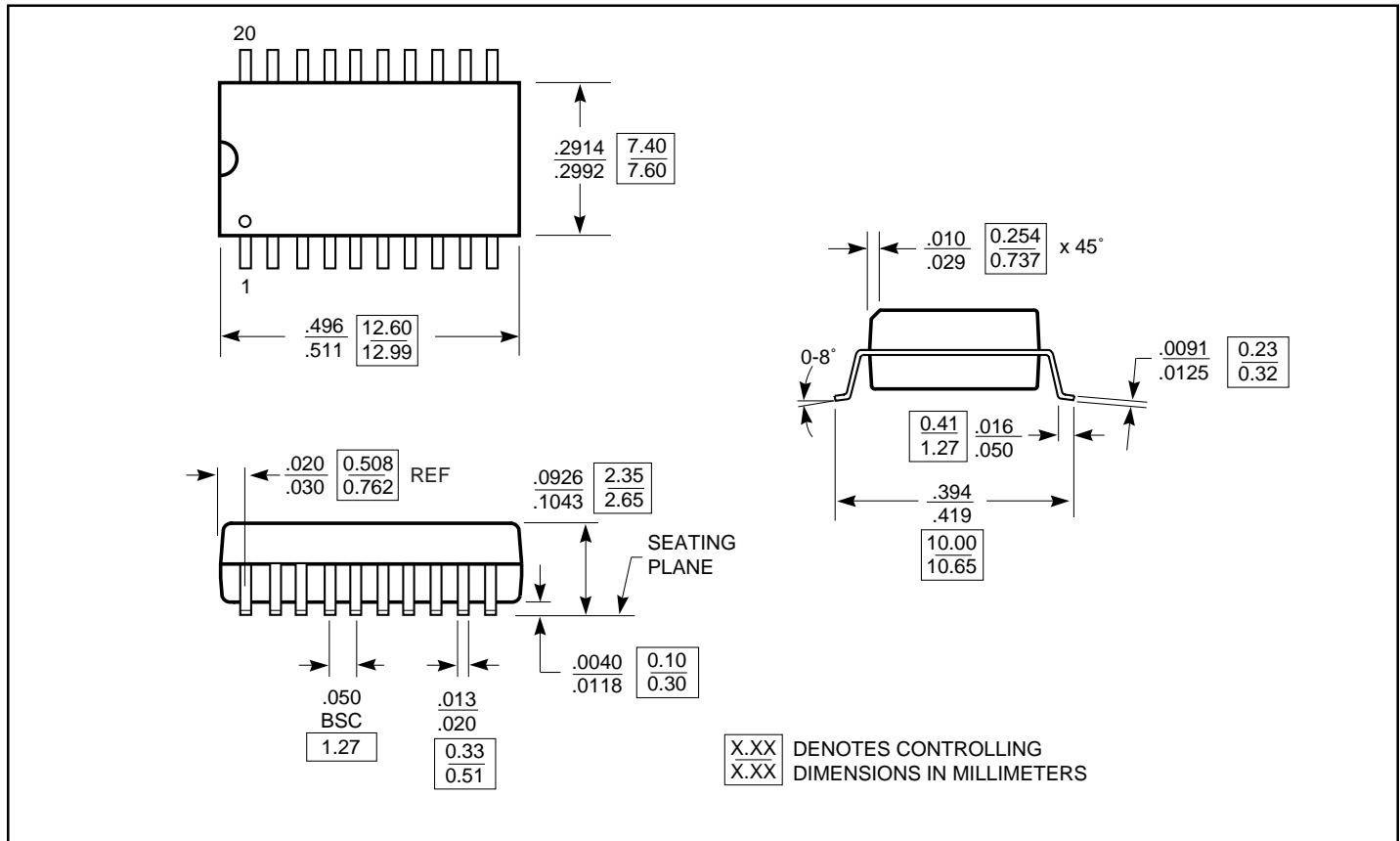
Output Skew – $t_{SK(o)}$



Package Skew – $t_{SK(t)}$



20-Pin 209-Mil SSOP (H)

20-Pin 150-Mil QSOP (Q)


20-Pin 300-Mil SOIC (S)

Ordering Information

| Part Number | Marking Code |
|---------------|---------------|
| PI49FCT807xTp | PI49FCT807Tpx |
| PI49FCT2807Tp | PI49FCT2807Tp |

Note: x = Speed Grades: "blank", A, B, C.

p = Package Type:

H=209-mil SSOP

Q=150-mil QSOP

S=300-mil SOIC

Example:

PI49FCT807ATH=A grade,

Hpkg marked as PI49FCT807THA